LONDON-WEST MIDLANDS ENVIRONMENTAL STATEMENT

Volume 5 | Technical Appendices

CFA8 | The Chalfonts and Amersham

Data appendix (LQ-001-008)

Land quality

November 2013

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1 Introduction

1.1.1 The land quality appendix for the Chalfonts and Amersham community forum area (CFA8) comprises:

- a summary of engagement undertaken (Section 2);
- detailed risk assessment (Section 3);
- inspection notes and other site data (Section 4);
- geological sites of special scientific interest (SSSI) and local geological sites (LGS)(Section 5); and
- mining and minerals data (Section 6).

1.1.2 Maps referred to throughout the land quality appendix are contained in the Maps LQ-01-013 to LQ-01-016 Volume 5, Land Quality Map Book.

2 Engagement

2.1.1 Table 1 sets out the local authorities and other organisations that have been engaged with during the preparation of the land quality section of the environmental impact assessment (EIA) for this study area, the types of information that have been provided to the assessment team and any specific concerns of those with whom the team engaged.

Table 1: Engagement on land quality issues undertaken for the Chalfonts and Amersham study area

Local authority or other organisation	Method/dates of contact	Information provided and/or specific concerns
Buckinghamshire County Council	Contact via email on: 28 November 2012; 3 December 2012; 21 December 2012; 2 January 2013; 23 January 2013; 1 February 2013; 9 February 2013; and 2 May 2013.	Initial email regarding detailed mineral areas for assessing sterilisation of resources and requesting landfill data to provide more detail on what has already been received to assess contamination potential. Buckinghamshire County Council responded with the data requested regarding minerals and waste sites, as well as links to minerals safeguarding area (MSA) on the Buckinghamshire County Council website. Buckinghamshire County Council also supplied (GIS) data showing MSA, preferred areas and landfill data and confirmed it does not have a designated petroleum officer or hold any information on underground storage tanks (UST).
Chiltern District Council (CDC)	Contact via email on: 28 November 2012, 24 January 2013, 4 February 2013, 29 February 2013 and 10 May 2013. Contact via telephone on: 2 May 2013.	CDC supplied requested information regarding sites that have potential land contamination, including GIS data and Part IIA[1] sites and are in the vicinity of the Proposed Scheme; information regarding UST on Hyde Heath Road was also provided.
Hertfordshire County Council (HCC)	Contact via email on: 25 October 2012, 7 November 2012, 3 January 2013, 21 January 2013 and 21 February 2013.	HCC responded with the requested data listing minerals planning permissions located in the area of interest in mapping format data (shapefiles). HCC supplied the requested GIS data for mineral safeguarding sites.
Three Rivers District Council	Contact via email on: 3 October 2012.	TRDC supplied requested information on potentially contaminated land, providing an image of landfills in the area using data from TRDC database and confirmed that no Part IIA

[1] *Environmental Protection Act 1990*, Part IIA, London, Her Majesty's Stationary Office.

Local authority or other organisation	Method/dates of contact	Information provided and/or specific concerns
(TRDC)		sites are present in the district.
Environment Agency	Contact via email on: 24 April 2013; 15 May 2013; 24 May 2013; 12 June 2013; 14 June 2013; 27 June 2013; and 8 June 2013.	The Environment Agency has been contacted to supply information on landfills within the study area - data outstanding at time of production of this report.

3 Detailed risk assessment

3.1.1 This appendix presents assessments for areas potentially posing a contaminative risk for the Proposed Scheme within the study area. For each site the following data is presented:

- baseline risk assessment;
- construction risk assessment;
- post-construction risk assessment; and
- assessment of temporary (construction) and permanent (post-construction) effects.

3.1.2 This risk assessment incorporates the following assumptions:

- construction workers are not included as part of this assessment;
- sites that have been assessed as potentially posing a contaminative risk to the Proposed Scheme have been grouped and considered together where appropriate. It should be noted that some parcels of land may have had several land uses from different epochs;
- during construction standard mitigation procedures will be in place in accordance with the draft Code of Construction Practice (CoCP) (Volume 5: Appendix CT-003-000); and
- during the post-construction condition it is assumed that all required remediation has been undertaken and carried out.

3.1.3 The sites assessed in this study area are shown on the Maps LQ-01-013 to LQ-01-016 (Volume 5, Land Quality Map Book).

Table 2: Sites included in the detailed risk assessment within the Chalfonts and Amersham study area

Area reference	Area name	Table numbers
8-1	Inert landfill at Warren Farm	3, 5, 7, 9
8-6	Round Dell Wood Landfill	4, 6, 8, 10

3.1.4 Contaminant types included within the risk assessments are based on the Priority Contaminants Report CLR 8[2]. Although withdrawn, this document is still commonly used and is considered good practice.

3.1.5 The remainder of this section presents the risk assessment for the sites set out in Table 2. The following acronyms are used in these tables:

- CSM - conceptual site model; and
- VOC - volatile organic compounds.

[2] Defra and Environment Agency, (2002), *Potential contaminants for the assessment of land- R&D Publication*, Bristol, Environment Agency.

3.1 Baseline risk assessment

Table 3: Baseline CSM and qualitative risk assessment - inert landfill at Warren Farm (Area ref 8-1)

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Inert landfill at Warren Farm Fly tipping observed at entrance to caravan site (no further access possible) Contaminants that could be present include, but are not limited to: heavy metals, asbestos, organic compounds e.g. oils, inorganic compounds e.g. ammoniacal nitrogen and chloride, and ground gases (largely methane, carbon dioxide and VOC)	Sensitive land use On-site caravan site Adjacent housing	Inhalation/ingestion of or dermal contact with windblown contaminated soils/dust	Low likelihood	Moderate	Moderate/low
		Inhalation of vapours derived from contaminated groundwater/soil	Low likelihood	Moderate	Moderate/low
		Exposure to asphyxiative or explosive gases	Low likelihood	Severe	Moderate
	Controlled waters Secondary A Gerrards Cross gravel aquifer at surface	Vertical and lateral migration of contaminated groundwater/leachate	Likely	Severe	High
	Controlled waters Principal Chalk aquifer at depth	Vertical and lateral migration of contaminated groundwater/leachate	Likely	Severe	High
	Property Caravans on-site	Concentration of asphyxiative or explosive gases	Unlikely	Severe	Moderate/low
	Property Adjacent housing	Lateral migration and concentration of asphyxiative or explosive gases	Low likelihood	Severe	Moderate

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
		Direct contact of below ground building structures and services with contaminated groundwater/soil	Low likelihood	Negligible	Very low

Table 4: Baseline CSM and qualitative risk assessment – Round Dell Wood Landfill (Area ref 8-6)

Source	Receptor	Pathway	Probability	Consequence	Risk at baseline without mitigation
Round Dell Wood landfill. Recorded to have accepted inert and household waste Contaminants that could be present include, but are not limited to: heavy metals, asbestos, organic compounds e.g. oils, inorganic compounds e.g. ammoniacal nitrogen and chloride, and ground gases (largely methane, carbon dioxide VOC)	Controlled waters Principal Chalk aquifer at surface	Vertical and lateral migration of contaminated groundwater/leachate	Likely	Severe	High

3.2 Construction risk assessment

Table 5: Construction CSM and qualitative risk assessment- inert landfill at Warren Farm (Area ref 8-1)

Source	Receptor	Pathway	Probability	Consequence	Risk with construction stage mitigation
Inert landfill at Warren Farm Fly tipping observed at entrance to caravan site (no further access possible) Contaminants that could be present include, but are not limited to: heavy metals, asbestos, organic compounds e.g. oils, inorganic compounds e.g. ammoniacal nitrogen and chloride, and ground gases (largely methane, carbon dioxide and VOC)	Sensitive land use On-site caravan site Adjacent housing	Inhalation/ingestion of or dermal contact with windblown contaminated soils/dust	Low likelihood	Moderate	Moderate/low
		Inhalation of vapours derived from contaminated groundwater/soil	Low likelihood	Moderate	Moderate/low
		Exposure to asphyxiative or explosive gases	Low likelihood	Severe	Moderate
	Controlled waters Secondary A Gerrards Cross gravel aquifer at surface	Vertical and lateral migration of contaminated groundwater/leachate	Likely	Severe	High
	Controlled waters Principal Chalk aquifer at depth	Vertical and lateral migration of contaminated groundwater/leachate	Likely	Severe	High
	Property Caravans on-site	Concentration of asphyxiative or explosive gases	Unlikely	Severe	Moderate/low
	Property Adjacent housing	Lateral migration and concentration of asphyxiative or explosive gases	Low likelihood	Severe	Moderate

Source	Receptor	Pathway	Probability	Consequence	Risk with construction stage mitigation
		Direct contact of below ground building structures and services with contaminated groundwater/soil	Low likelihood	Negligible	Very low

Table 6: Construction CSM and qualitative risk assessment – Round Dell Wood Landfill (Area ref 8-6)

Source	Receptor	Pathway	Probability	Consequence	Risk with construction stage mitigation
Round Dell Wood landfill. Recorded to have accepted inert and household waste Contaminants that could be present include, but are not limited to: heavy metals, asbestos, organic compounds e.g. oils, inorganic compounds e.g. ammoniacal nitrogen and chloride, and ground gases (largely methane, carbon dioxide and VOC)	Controlled waters Principal Chalk aquifer at surface	Vertical and lateral migration of contaminated groundwater/leachate	Likely	Severe	High

3.3 Post-construction risk assessment

Table 7: Post-construction CSM and qualitative risk assessment- inert landfill at Warren Farm (Area ref 8-1)

Source	Receptor	Pathway	Probability	Consequence	Risk with permanent works mitigation
Inert landfill at Warren Farm Fly tipping observed at entrance to caravan site (no further access possible) Contaminants that could be present include, but are not limited to: heavy metals, asbestos, organic compounds e.g. oils, inorganic compounds e.g. ammoniacal nitrogen and chloride, and ground gases (largely methane, carbon dioxide and VOC)	Sensitive land use On-site caravan site Adjacent housing	Inhalation/ingestion of or dermal contact with windblown contaminated soils/dust	Low likelihood	Moderate	Moderate/low
		Inhalation of vapours derived from contaminated groundwater/soil	Low likelihood	Moderate	Moderate/low
		Exposure to asphyxiative or explosive gases	Low likelihood	Severe	Moderate
	Controlled waters Secondary A Gerrards Cross gravel aquifer at surface	Vertical and lateral migration of contaminated groundwater/leachate	Likely	Severe	High
	Controlled waters Principal Chalk aquifer at depth	Vertical and lateral migration of contaminated groundwater/leachate	Likely	Severe	High
	Property Caravans on-site	Concentration of asphyxiative or explosive gases	Unlikely	Severe	Moderate/low
	Property Adjacent housing	Lateral migration and concentration of asphyxiative or explosive gases	Low likelihood	Severe	Moderate

Source	Receptor	Pathway	Probability	Consequence	Risk with permanent works mitigation
		Direct contact of below ground building structures and services with contaminated groundwater/soil	Low likelihood	Negligible	Very low

Table 8: Post-construction CSM and qualitative risk assessment – Round Dell Wood Landfill (Area ref 8-6)

Source	Receptor	Pathway	Probability	Consequence	Risk with permanent works mitigation
Round Dell Wood landfill. Recorded to have accepted inert and household waste Contaminants that could be present include, but are not limited to: heavy metals, asbestos, organic compounds e.g. oils, inorganic compounds e.g. ammoniacal nitrogen and chloride, and ground gases (largely methane, carbon dioxide and VOC)	Controlled waters Principal Chalk aquifer at surface	Vertical and lateral migration of contaminated groundwater/leachate	Likely	Severe	High

3.4 Assessment of temporary (construction) and permanent (post-construction) effects

Table 9: Significance of impact during construction and post construction – inert landfill at Warren Farm (Area ref 8-1)

Contaminant linkage	Baseline risk	Construction risk	Post-construction risk	Construction significance	Post-construction significance
Inhalation/ingestion/dermal contact of contaminated soils/dusts by on-site caravan users and adjacent residents	Moderate/low	Moderate/low	Moderate/low	Negligible	Negligible
Inhalation of vapours derived from contaminated groundwater/soil by adjacent residents	Moderate/low	Moderate/low	Moderate/low	Negligible	Negligible
Exposure to asphyxiative or explosive gases by adjacent residents	Moderate	Moderate	Moderate	Negligible	Negligible
Vertical and lateral migration of contaminated groundwater/leachate into the Secondary A Gerrards Cross gravel aquifer at surface	High	High	High	Negligible	Negligible
Vertical and lateral migration of contaminated groundwater/leachate into the Principal Chalk aquifer at depth	High	High	High	Negligible	Negligible
Build-up of asphyxiative or explosive gases in on-site caravans	Moderate/low	Moderate/low	Moderate/low	Negligible	Negligible
Lateral migration and build-up of asphyxiative or explosive gases in adjacent housing	Moderate	Moderate	Moderate	Negligible	Negligible
Direct contact of below ground building structures and services at adjacent housing with contaminated groundwater/soil	Very low	Very low	Very low	Negligible	Negligible
Overall significance				Negligible	Negligible

Table 10: Significance of impact during construction and post construction – Round Dell Wood Landfill (Area ref 8-6)

Contaminant linkage	**Baseline risk**	**Construction risk**	**Post-construction risk**	**Construction significance**	**Post-construction significance**
Vertical and lateral migration of contaminated groundwater/leachate into the Principal Chalk aquifer at surface	High	High	High	Negligible	Negligible
Overall significance				Negligible	Negligible

4 Inspection notes and other site data

4.1.1 This appendix presents the following data provided by Chiltern District Council regarding underground petroleum storage tanks on Hyde Heath Road. There were no site visits carried out due to access constraints. Table 11 presents Chiltern District Council's underground storage tank location information

Table 11: Chiltern District Council underground storage tank location information

Sent: 10 May 2013.

The information we hold on underground storage tanks at the site of Eagle Garage on Hyde Heath Road is as follows:

Heath Motors Eagle Garage Hyde Heath Road Hyde Heath Buckinghamshire HP6 5RW

There were 4 underground storage tanks at the site which were installed on 01/08/62 and each held approximately 1000 gallons.

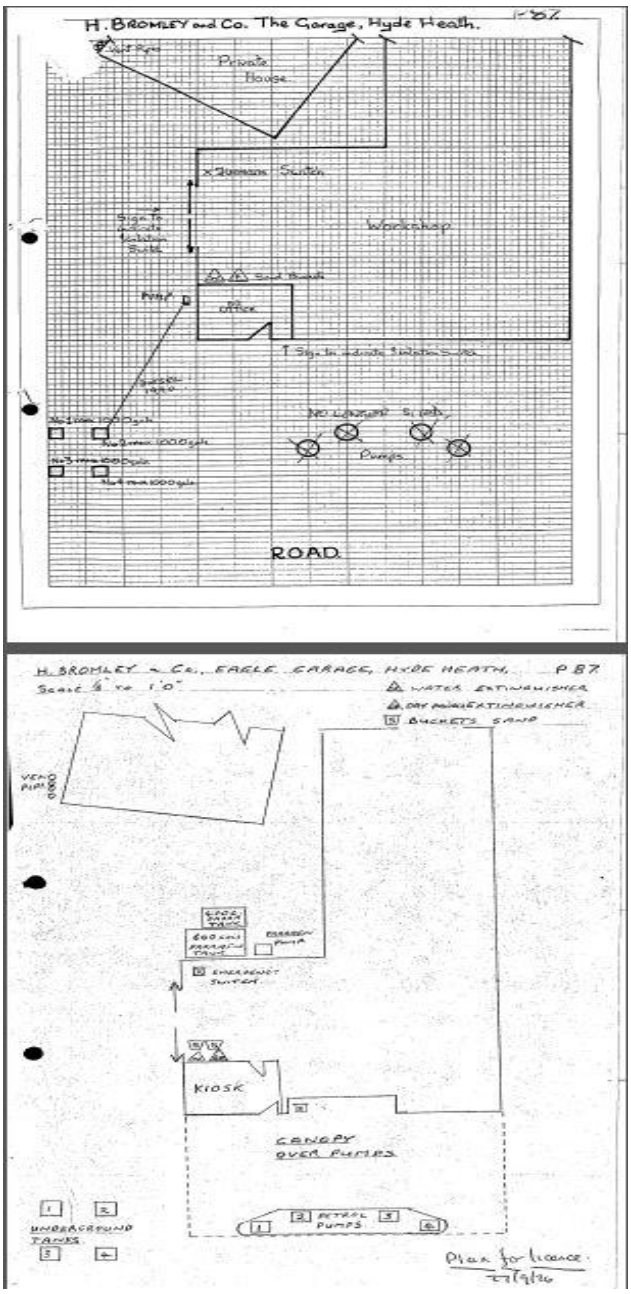
In January 1991, three of these tanks were cement/sand slurry filled. Tank number 2 remained in service for the storage of diesel oil only.

I have attached a couple of location plans that form part of the Bucks County Council Petroleum Licence dated around 1990 and 1976 respectively that may provide an idea of the location of the tanks within the site.

As advised last week on the telephone, sites 2 and 3 do not fall within CDC so we do not hold any information on these.

4.1.2 In addition Chiltern District Council provided underground storage tank hand drawn location plans for Hyde Heath Road Garage, these are shown in Figure 1.

Figure 1 Chiltern District Council underground storage tank hand drawn location plans for Hyde Heath Road Garage



5 Geological sites of special scientific interest and local geological sites

5.1.1 One geological SSSI has been identified in the study area. The Froghall Brickworks geological SSSI is located approximately 260m from the centreline of the route, just on the edge of the study area and has been designated of high importance due to the exposure of Westland Green Gravel (see Map LQ-01-014 Volume 5, Land Quality Map Book).

6 Mining and minerals data

6.1.1 The Buckinghamshire Minerals and Waste Core Strategy development plan document (DPD) 2012 shows that the route passes through a minerals safeguarding area (MSA) which is presented in Map LQ-01-31 to LQ-01-016. The southern end of the Chalfonts and Amersham area is located within a MSA and mineral consultation area for sand and gravel both of which cover the same area as designated by Buckinghamshire County Council.

6.1.2 There is an existing planning application at Froghall Brickworks for brick earth extraction; there are, however, no records of current mineral extraction. Details are provided in Table 12.

Table 12: Planning application details at Froghall Brickworks

Site Name	Location	Planning reference
Froghall Brickworks	Chalfont St. Giles Froghall Brick and Tile Company, Bottrells Lane, Chalfont St. Giles, Buckinghamshire, HP84EQ	CH/2010/60002/BCC

7 References

Defra and Environment Agency, (2002), *Potential contaminants for the assessment of land - R&D Publication*, Bristol, Environment Agency.

Environmental Protection Act 1990, Part IIA, London, Her Majesty's Stationary Office.